

Appl. No. 10/733,860
Response dated June 2, 2005
Reply to Office action of March 2, 2005

Amendments to the Specification

Please replace paragraph [0169] on page 56 with the following amended paragraph:

[0169] As the user performs the click-and-drag operation in the method 2000 of Figure 20 for translating mapped texture, the cursor/tool is constrained to the region bound by the user-drawn curve 1806 to which the texture is mapped, as indicated in step 2012 of Figure 20 and as illustrated in Figures 21A, 21B, and 21C. Superimposed on this haptic constraint is a haptic detent at the initial click position, as indicated in step 2020 of Figure 20. The haptic detent allows a user to find the original click position and effectively cancel a texture translation adjustment. During the click-and-drag operation, the user is provided visual feedback as indicated in steps 2014, 2016, and 2018 of Figure 20. In step 2014, the position of the widget 1804 is dynamically updated according to the new cursor/tool position, as the user drags the hotspot. In step 2016, the base plane and surface normal orientation is dynamically updated according to the new cursor/tool position so that the X-axis (2106), Y-axis, and Z-axis (2108) of the widget 1804 may be properly displayed as the user moves the widget across the surface of the virtual object 1802. Furthermore, a "ghost" image of the widget as it appeared at the initial click position may be displayed as indicated in step 2018, to serve as a visual cue of the original user click position. The ghost image may be a thin, grey version of the widget.

Please replace paragraph [0175] on page 60 with the following amended paragraph:

[0175] Figure 23A is a screenshot 2300 showing the virtual object 1802 and haptic/graphical user interface element (widget) 1804 of Figure 18A following a haptic snap to the hotspot 1810 for scaling texture 2308 along the X-axis 2306 of the widget. Figure 23B is a screenshot 2320 during a user "click-and-drag" operation at the hotspot 1810, where the cursor/tool is haptically

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constrained to the user-defined region 1806 on the surface of the virtual object 1802. In Figure 23B, the user has dragged the cursor along the X-axis such that the tile size of the texture 2308 is increased to 66.0 x 66.0 mm. The updated scaling value is indicated by the text box 2324. In Figures 23B and 23C, the axes of the texture aligning with both the X-axis 2306 and Y-axis 2302 axes are scaled simultaneously, according to an adjustment, here, of the X-axis hotspot. A similar adjustment may be made using the Y-axis hotspot. In another embodiment, the X-axis 2306 and Y-axis 2302 are scaled separately. The screenshot 2340 of Figure 23 shows that the user has further dragged the cursor along the X-axis 2306 of the widget 2322 to increase the tile size of the texture 2308 to 91.4 x 91.4 mm. Figure 24A is a screenshot 2400 showing the virtual object 1802 and widget of Figure 18A following a haptic snap to the Z-axis end-arrow hotspot 1814. The user clicks-and-drags the Z-axis hotspot 1814 to adjust an embossing height and/or depth applied within the user defined region 1806 on the surface of the virtual object 1802. Figure 24A shows a visual representation of the Y-axis 2401 of the widget 2404 following a haptic snap to the Z-axis hotspot 1814. Figure 24B is a screenshot 2420 showing the widget 2404 following an adjustment of the depth of the applied texture 2308 to 8.5mm, as indicated by the text box 2426. The inactive axes are visually diminished 2422, while a thin grey line 2424 indicates the haptic constraint along the Z-axis in effect during the click-and-drag operation performed by the user.

Please replace paragraph [0179] on page 63 with the following amended paragraph:

[0179] Figure 26A is a screenshot 2600 showing the virtual object 1802 and haptic/graphical user interface element (widget) 1804 following a haptic snap to one of the hotspots 1816, 1818 for rotating texture that is mapped on the the surface of the virtual object 1802. The active Y-axis of the widget is indicated at reference 2606, and this axis is dynamically updated according

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to the user manipulation of the cursor/tool about the constraint ring 2621, as shown in Figures 26B and 26C. The inactive X-axis is indicated by a thin grey line 2602 or is hidden. A text box 2624 dynamically indicates a numerical rotation value corresponding to the current cursor/tool position. In Figure 26B, the user has rotated the texture 2308 by -37.4 degrees from the click position; and in Figure 26C, the user has rotated the texture 2308 by -72.4 degrees from the original click position. Reference 2622 in Figures 26B and 26C is a ghost image of the widget as it appeared at the initial click position. The texture 2308 shown in Figures 26A, 26B, and 26C is an embossing pattern. The texture 2308 may alternatively be an image or a repeating (tiled) two-dimensional pattern, for example.